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## THE ANO NUEVO STELLER SEA LION ROOKERY

BY BARTON WARREN EVERMANN

[Plates 1-8]

For many years the relation of the sea lions to the commercial fisheries of the California coast has been a matter of much concern. The commercial fishermen have, with scarcely an exception, contended that the sea lions are very destructive to the fisheries. There are two species, the Steller sea lion (*Eumetopias stelleri*) and the California sea lion (*Zalophus californianus*), and they are both condemned by the fishermen. The former has rookeries from San Miguel Island northward, the latter ranges from San Francisco southward, the two species overlapping at the Golden Gate.

Complaints that the sea lions are very destructive to the fisheries, especially of Monterey Bay and vicinity, come in periodically to the Lighthouse Service and to the California Fish and Game Commission. The commercial fishermen have urged that the seals be exterminated, or at least that their numbers be greatly reduced. Usually these requests have been denied, chiefly on the ground that the feeding habits of the sea lions of the California coast have not been studied sufficiently to determine to what extent, if at all, they are destructive to the commercial fisheries.

In the summer of 1899, the late Prof. L. L. Dyche made some study of this question in and near Monterey Bay. Professor Dyche examined the stomachs of 25 sea lions and found not a trace of fish in any of them. In the summer of 1901, at the instance of the California Fish and Game Commission, the matter was again taken up, and a special commission of three naturalists was appointed to make an investigation. The commission consisted of the late Cloudsley Rutter of the United States Fish Commission, Prof. Edwin C. Starks representing the California Academy of Sciences, and Robert E. Snodgrass for the California Fish and Game Commission. These investigators began their work July 10, at the Purissima rookery, a few miles south of San Francisco. They visited most of the rookeries on the coasts of California, Oregon, and Washington, including Año Nuevo and the Farallons. They killed and examined stomach contents of 18 Steller sea lions and 24 California sea lions. The stomachs of only 26 (13 of each species) contained food. All of the Stellers had eaten fish, and five had eaten squid or octopus. The number of squid was small, six being

the maximum number in one sea lion, while the quantity of fish was large, at least 35 pounds being taken from one stomach. Of the 13 California sea lions whose stomachs contained food, five had eaten fish and eleven had eaten squid. The quantity of fish was trivial, 17 small fish being the maximum, while the remains of 100 to 300 squid were found in each of five stomachs. These studies indicated that the Steller sea lion is largely a fish eater and that the California sea lion feeds chiefly on squid.

Further north, off the mouth of the Columbia, the fishermen claimed that the Steller sea lions do great damage to the salmon fisheries, but Mr. Rutter was not able to secure much convincing evidence.

While the investigations of the Rutter party were not sufficiently comprehensive or prolonged to warrant a final decision, they show rather definitely that sea lions cause very little damage to the fisheries, and the little injury that is done is caused by the Steller sea lion, the California sea lion being almost entirely guiltless.

It is a matter for regret that these investigations were not continued. Apparently no further study of the habits of the sea lions on the California coast has been made since 1901.

Recently representations have been made to Capt. H. W. Rhodes, superintendent of lighthouses, 18th District, that sea lions are doing great damage to the commercial fisheries and permission to kill sea lions on the lighthouse reservations has been requested. On June 24, 1920, the Bureau of Fisheries wired me asking whether I would recommend granting to private companies the privilege of killing sea lions for commercial purposes on the lighthouse reservations. Before replying to the Bureau I decided to visit Año Nuevo Island and make a study of the present condition of that rookery.

This I did in company with Mr. Joseph Mailliard, curator of birds and mammals in the museum of the California Academy of Sciences. Permission to land on the island was given us by Captain Rhodes who also kindly instructed the keeper to show us every courtesy and assist us in everyway possible. We reached the island soon after noon June 27 and remained until noon the next day.

The largest and most important Steller sea lion rookery now on the California coast is that on Año Nuevo (or New Year's) Island. This island lies about one-half mile off shore, 13 miles below the quaint little village of Pescadero, or 63 miles down the coast from San Francisco. The island consists of one main body with an area of two or three acres and a number of outlying rocks upon which the sea lions haul out and

have their breeding grounds. These rocks are a hard, flinty, evenly bedded shale of the Chico Cretaceous, and considerably tilted, the dip being southwest and seaward at an angle of 10 to 50 degrees. The surface is relatively smooth, one end being always a-wash, the other 10 to 20 feet above the water except at unusually high tides or during storms. The island and its outlying rocks constitute a lighthouse reservation and the sea lions and sea birds breeding thereon have always been protected. Permission to kill the sea lions on this rookery has been sought by commercial fishermen and others but has never been granted. Permits have, however, been given on two or three occasions to kill a few animals for museum purposes.

During the time of our visit the weather was ideal and we were able to observe and study the animals quite satisfactorily. We found the sea lions occupying five principal rocks, with a few on two or three smaller rocks. On the five larger rocks the animals apparently covered all the available space; in many places they were lying so close together as to make a continuous mass. On the smaller, lower rocks they were not so closely placed and were moving about more than in the larger, more compact masses. Most of them were quiet and apparently sleeping, but many kept moving about more or less, the old bulls holding their heads high, roaring now and then, often gaping as if drowsy, or chasing other bulls away, sometimes fighting savagely. In these fierce fights between rival bulls the cows and pups often suffered severely. Several old bulls were seen with great gashes or wounds evidently inflicted by their rivals. At least four old bulls were seen so severely wounded that each had withdrawn from the rookery proper and retreated to some rock or unoccupied, isolated station. One large dead bull was seen, evidently killed in some conflict.

The nearest occupied rock contained seven adult bulls, two cows and one pup. This was apparently not a permanent part of the rookery and all the seals took to the water upon our approach. The next rock was completely covered. As a result of four counts, we placed the number on this rock at not fewer than 200. At the right were other sloping smooth rocks on which there were between 300 and 400 seals. A smaller rock beyond these contained at least 100 animals. Still further away were two much larger, oblong rocks, on each of which we counted about 500 seals. To the right of these were some low-lying rocks, always a-wash, on which there were usually 10 to 30 seals. As the seals seemed to come and go on these rocks they probably do not constitute a permanent part of the rookery.



STELLER SEA LION HABITAT GROUP IN THE MUSEUM OF THE CALIFORNIA ACADEMY OF SCIENCES

It shows a portion of the rookery on Año Nuevo Island. Group prepared under the immediate direction of John Rowley.  
Background painted by Charles Abel Corwin. Photo by Gabriel Moulin.



FIG. 1. AÑO NUEVO STELLER SEA LION ROOKERY

On each of the large rocks in the distance there were about 500 sea lions June 28, 1920.



FIG. 2. AÑO NUEVO STELLER SEA LION ROOKERY, IN PART

On the rock in the distance there were about 500 animals June 28, 1920. Photos by Joseph Mailliard.



FIG. 1. AÑO NUEVO STELLER SEA LION ROOKERY

This part of the rookery contained about 800 animals June 27-28, 1920

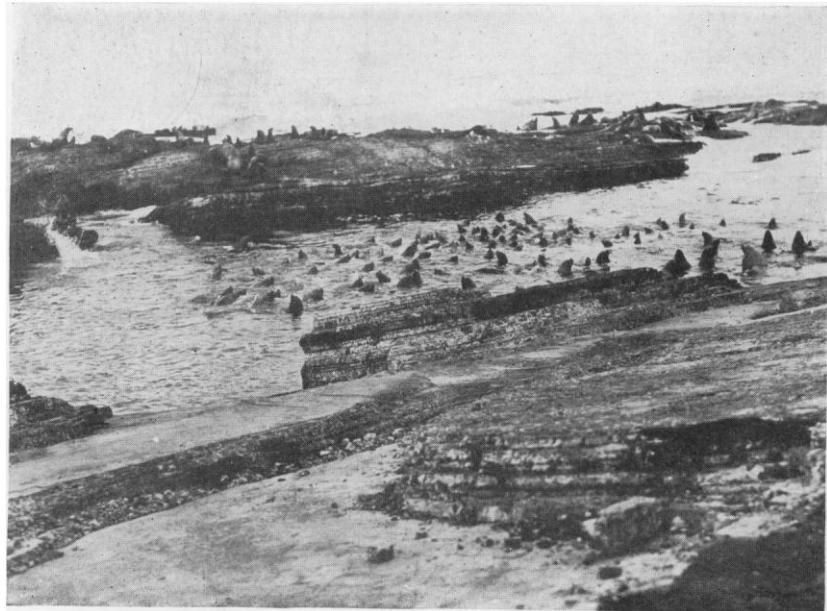


FIG. 2. A PORTION OF THE STELLER SEA LION ROOKERY ON AÑO NUEVO ISLAND

When approached too near the animals take to the water. Note the large number of old bulls. June 28, 1920. Photos by Joseph Mailliard.

As a result of counting the animals six to nine times in each of the groups we agreed that the total number was between 1500 and 2000, with the probability that 2000 is more nearly correct. The two things that impressed us most were the preponderance of adult bulls and the scarcity of pups. The light keeper, J. O. Becker, estimated the number of bulls at twice the number of cows. This may be an overestimate, but it is quite conservative to say that the number of adult bulls is at least half as great as the number of cows. The number of young bulls was also large. The greatest number of cows seen in any one harem was 7; usually there were only 1 to 5.

Very few pups could be seen on the rocks, certainly not more than 100 all told. But in the little nooks and coves, both in the water and on the beach, fully as many more were seen dead or dying. In one place we counted 34 dead pups in the water washing back and forth with the waves. In another protected cove were 24 pups, 19 dead and 5 evidently dying of starvation. In yet other places from 1 to 12 or 15 were counted. The total number of dead or dying pups actually counted was 106; there doubtless were many others. This condition was caused by a severe storm which occurred about the middle of June when the sea washed over the entire rookery, washing practically all the pups off the rocks and into the water. At that time the pups had not yet learned to swim and many were drowned outright. Others were probably so seriously injured they could not get back upon the rocks, and still others were washed ashore. The mothers do not appear to make any search for them and they crawl about and finally starve.

It is quite evident that there is a large excess of adult bulls in the Año Nuevo herd. The presence of these surplus bulls on the rookery results in severe fighting in which cows are injured and pups trampled to death. These surplus bulls should be killed and I have recommended that the Lighthouse Service kill 100 for their hides and oil.

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